



**State of Louisiana
Department of Natural Resources
Coastal Restoration Division**

**2006/2007 Annual Inspection
Report**

for

**CAERNARVON OUTFALL
MANAGEMENT
(BS-03a)**

State Project Number BS-03a
Priority Project List 2

July 18, 2007
Plaquemines Parish

Prepared by:

Tom Bernard, P.E.
Peter Hopkins, P.E.
LDNR/Coastal Engineering Division
New Orleans Field Office
CERM, Suit 309
2045 Lakeshore Dr.
New Orleans, La 70122

Table Of Contents

I. Introduction.....	1
II. Inspection Purpose and Procedures	1
III. Project Description and History	1
IV. Summary of Past Operations and Maintenance Projects	5
V. Inspection Results	5
VI. Conclusions and Recommendations... ..	7

Appendixes

Appendix A Project Features Map

Appendix B Photographs

Appendix C Three Year Operations & Maintenance Budgets Projection

Appendix D Field Inspection Form

I. Introduction

The Caernarvon Outfall Management Project (State Project No. BS-03a) was approved on the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) Second Priority Project List. The project is located to the south and west of Big Mar, a body of water which formed as the result of a failed agricultural impoundment. The project features are located entirely in Plaquemines Parish and the project outfall area encompasses 15,556 acres in Plaquemines Parish. Project features are located on a number of streams in the outfall area.

II. Inspection Purpose and Procedures

The purpose of the annual inspection of the Caernarvon Outfall Management Project (BA-03a) is to evaluate the constructed project features to identify any deficiencies and prepare a report detailing the condition of project features and recommended corrective actions needed. Should it be determined that corrective actions are needed, LDNR shall provide, in the report, a detailed cost estimate for engineering, design, supervision, inspection, and construction contingencies, and an assessment of the urgency of such repairs (O&M Plan May 15, 2003). The annual inspection report also contains a summary of maintenance projects and an estimated projected budget for the upcoming three (3) years for operation, maintenance and rehabilitation. The three (3) year projected operation and maintenance budget is shown in Appendix C. A summary of past operation and maintenance projects completed since completion of the Caernarvon Outfall Management Project are outlined in Section IV.

This annual inspection of the Caernarvon Outfall Management Project (BA-03a) was held on March 27, 2007 on a clear and warm day with winds SW 10 to 15 mph. At the time of the inspection all 5 gates of the diversion structure were open 8 feet with a flow of 5,100 cubic feet per second. The Marsh Gage reading was +2.8 feet NGVD and the River Gage reading was +4.5 feet NGVD. In attendance were Tom Bernard, Barry Richard, Brady Carter, and Peter Hopkins of LDNR; and Warren Blanchard of NRCS. The team left the Delacroix Corporation boat launch in Caernarvon at mid-morning. Photographs of that inspection are included in Appendix B of this report.

III. Project Description and History

In August, 1991, the Caernarvon Freshwater Diversion Structure on the east bank of the Mississippi River near Big Mar, was placed into operation. The Caernarvon structure was constructed (construction funded by the Water Resources Development Act) for the purpose of diverting Mississippi River water through Big Mar into the marshes to the south and west of Big Mar. These marshes, since the early 1900's, had deteriorated due, largely, to being isolated, because of levee construction, from direct river influxes. This isolation, with the resultant absence of minerals and nutrients formerly regularly deposited during high river stages, caused a net loss of the organic soils prevalent in the

project area. The specific mechanisms causing the soil loss included natural subsidence, erosion, salt water intrusion and oxidation.

In addition to the losses due to Mississippi River levee construction, the increased construction of navigation and oil/gas canals in the project area contributed to the problem. These straight canals provided a perfect avenue for saltwater intrusion and the canals' high water velocity led to increased erosion rates.

An earlier hurricane also contributed to the loss of wetlands in the project area. In 1965, storm surges from Hurricane Betsy traveled over the above-discussed canals and the forested swamp area in the northern part of the project area was destroyed by salt stress when the salt water from the storm surge became trapped behind Tigers Ridge.

From 1932 to 1990, 5,546 acres of land in the project area were converted to open water via the above-discussed mechanisms. In addition, by 1978, saltwater intrusion had transformed the project area from a primarily intermediate marsh to primarily a brackish marsh.

The Caernarvon Freshwater Diversion Structure was intended to counter some of the mechanisms causing wetlands loss in the project area particularly the saltwater intrusion and loss of sediment input resulting from the Mississippi River levee construction and the new oil/gas and navigation canals that have been constructed. Specifically, the Caernarvon structure was intended to increase wildlife and fisheries productivity, enhance emergent marsh vegetation growth, and reduce marsh loss.

The structure has a discharge capacity of approximately 8,000 cubic feet of freshwater per second. Once diversion waters enter Big Mar, 66% of the water exits to the southeast via Bayou Mandeville which flows into Lake Lery. Eventually this flow reaches Bayou Terre aux Boeufs. So, in summary, 66 % of the discharge water flows to the southeast of Big Mar and only 34 % flows to the more-deteriorated marshes to the southwest of Big Mar. An additional problem is that, prior to the present Caernarvon Outfall Management Project, much of the flow of water to the southwest channeled rapidly to the lower reaches of the basin and did not inundate the interior marshes as was originally intended. The present project promotes better utilization and distribution of water from the Caernarvon Freshwater Diversion Structure. Project features will allow water from the channels to flow into the marsh interior and will cause the water to be retained in the marsh for a longer period of time.

The project features are listed below:

All elevations are at NAVD 88. Inspection photos of the features are shown in an attachment.

A. Site/Structure # 13 – Rock fill channel plug with riprap armor located along the west bank of Bayou Mandeville. The plug is set at an elevation of +4.0 ft. and is 100 ft.

long x 100 ft. wide with 18 inches of riprap armor. The crest of the structure is 10 ft. wide. The plug includes a one (1) 48" diameter corrugated aluminum pipe which passes through the rock fill plug at an elevation of -3.5 ft. with an aluminum combination gate attached to the pipe on the interior side of the marsh. A timber walkway to the gate is at elevation +4.0.

B. Site/Structure # 25 - Earth and rock fill channel plug with riprap armor located on the Forty Arpent Canal near Big Mar. The plug is set at an elevation of +4.0 ft and is 169 ft. long and 100 ft. wide with 18 inches of riprap armor. The crest of the structure is 10 ft. wide. The plug includes two (2) 48" diameter corrugated aluminum pipes which pass through the rock fill (and are supported by the rock fill) at an elevation of -4.0 ft. Earth fill has been placed on each side of the rock fill. Aluminum canal gates are attached to the end of each pipe on the exterior side of the marsh. A timber walkway to the gates is at elevation +4.0.

C. Site/Structure # 26 – Earthen channel plug with riprap armor plate located along Reggio Canal spoil bank. The plug is set at a crest elevation of +4.0 ft. and is 154 ft. long and 100 ft. wide and is capped with 18 inches of riprap rock. The crest of the structure is 10 ft. wide. The plug includes four (4) 48" corrugated aluminum pipe which pass through the earthen material at an elevation of -4.0 ft. Aluminum canal gates are attached to the end of each pipe on the exterior side of the marsh. The pipe and gates are supported by a timber pile system. A timber walkway is installed at elevation +4.0 ft.

D. Site/Structure # 32 – Riprap channel plug across an unnamed channel which flowed into Lake Lery at the west end of the lake. The plug is 117 ft. long and the 6 ft. wide plug crest is set at +4.0 ft. The 70 ft. stretch of channel from the plug eastward to Lake Lery has 2 feet thick riprap placed on both channel banks.

E. Site/Structure # 40 – Earth fill and rock fill channel plug with riprap armor along the Reggio canal spoil bank. The plug is 142 ft. long and 100 ft. wide. The crest of the structure is 10 ft. wide and is set at an elevation of +4.0 ft. The plug includes 2- 48" diameter corrugated aluminum pipes thorough the rock fill portion of the rock fill at an elevation of -4.0 ft. Earth fill was placed on each side of the rock fill. The entire structure is capped with an 18" thick layer of rip-rap. Aluminum combination gates are attached to the ends of the aluminum pipes on the exterior side of the marsh. The pipe and gates are supported by a timber pile system and a timber walkway to the gates is installed at elevation +4.0 ft.

F. Site/Structure # 50 – Rock fill channel plug with riprap armor along the west bank of Bayou Mandeville. The plug is 55 ft. long and 100 ft. wide. The crest of the structure is 10 ft. wide and is set at an elevation of +4.0 ft. The plug includes one (1) 48" diameter corrugated aluminum pipe through an aggregate embankment at an elevation of -3.5 ft. The embankment is capped with an 18" thick layer of rip-rap. The pipe has a

combination gate attached on the pipe end on the interior side of the marsh. The pipe and gate are supported by a timber pile system and a timber walkway to the gate is installed at elevation +4.0.

G. Site/Structure # 52 – Rock fill channel plug with riprap armor along DP Canal spoil bank. The plug is 100 ft. long and 100 ft. wide. The crest of the structure is 10 ft. wide and is set at an elevation of +4.0 ft. The plug includes two (2) 36” diameter corrugated aluminum pipes through the embankment at -3.0 ft. The embankment is capped with a 18” thick layer of riprap. Aluminum combination gates are attached to the end of each pipe on the interior side of the marsh. The two pipes are supported by a timber pile system and a timber walkway to the gates is installed at elevation +4.0.

H. Site/Structure # 54 – Earth fill and rock fill channel plug with riprap armor located at the intersection of Reggio Canal and Promise Land Canal. The canal is 140 ft. long and 150 ft. wide. The crest of the structure is 10 ft. wide and is set at an elevation of +4.0 ft. The plug includes two (2) 48” diameter corrugated aluminum pipes through the rock fill portion of the embankment at an elevation of -4.0 ft. Earth fill was placed on each side of the rock fill. The entire embankment is capped with a 18” thick layer of riprap. Aluminum combination gates are attached to the end of each pipe on the exterior side of the marsh. The pipes and gates are supported by a timber pile system and a timber walkway to the gates installed at elevation +4.0 ft.

The existing spoil bank on the south side of Promise Land Canal was degraded in three locations on the west side of Structure # 54. The excavated material was placed on the south side behind the existing spoil bank.

I. Site/Structure # 56 - Rock riprap channel plug across an unnamed channel on the east side of the Reggio Canal. The plug is 208 ft. long and the side slopes of the plug are 3 horizontal to 1 vertical. The crest of the structure is 6 ft. wide and is set at an elevation of +4.0 ft.

J. Site #57 – Consists of 5,315 linear feet of spoil bank restoration along the east side of the Reggio Canal between the Delacroix Canal and Site # 54. The spoil bank restoration consists of an earth fill embankment placed on existing spoil to an elevation of +4.0 ft. with a 12 ft. top width and 3 horizontal to 3 vertical side slopes. The entire length of embankment has been seeded to permanent vegetation.

K. Site # 58 – Consists of 5,244 linear ft. of spoil bank restoration along the west side of Bayou Mandeville between the Delacroix Canal and Site # 13. The spoil bank restoration consists of an earth fill embankment placed on existing spoil to an elevation of +4.0 ft. with a 12 ft. top width and 3 horizontal to 3 vertical slope. The entire length of embankment has been seeded to permanent vegetation.

L. Site/Structure # 60 – Rock fill channel plug at the intersection of Reggio Canal and an existing pipeline canal. The plug is 200 ft. long and 100 ft. wide. The crest of the structure is 10 ft. wide and set at an elevation of +4.0. The plug includes two (2) 36” diameter corrugated aluminum pipes through the rock fill plug at an elevation of -3.0 ft. The entire length of the plug is capped with an 18” layer of riprap. Aluminum canal gates are attached to the end of each aluminum pipe on the interior side of the marsh. The pipes and gates are supported by a timber pile system and a timber walkway to the gates is installed at elevation +4.0 ft.

IV. Summary of Past Operation and Maintenance Projects

General Maintenance: Below is a summary of completed maintenance projects and operation tasks:

Three flow meters were installed at structures No. 26, 40, and 54 to monitor the flow of fresh water into the interior marshes to determine if it would be necessary to maintain the associated channels to increase flow. These flow meters were lost or removed as a result of the storm.

2006 Structure Operations:

In accordance with the operation schedule outlined in the Operations and Maintenance Plan. None of the structures were operated this past year. All gates have been left in the open position to allow fresh water in all the marsh areas except Structure 25, which is closed to minimize flow to the area behind Braithwaite, where emergency levee restoration is being constructed by the USACE.

For the near future, the structures will be open (structure 25 will be opened upon completion of the emergency levee repairs). In 2008, when the contract for operation of the main diversion structure is re-bid, the operation of the outfall structures will be included.

V. Inspection Results (See Appendix B for photos of each site)

Much of the marsh debris that was deposited throughout the area as a result of Hurricane Katrina has been cleared making the project accessible for this year's inspection. The main blockage, approx. 1,000 ft., still remains in the Delacroix Canal just east of structure #26. At the time of the inspection, water levels were high due to high diversion flows over a long period of time causing most of the marsh to be flooded. The water levels were only four to six inches from the bottom of the structure walkways and well above the tops of the culverts.

- A. Site/Structure # 13** – The gate was in the open position at the time of the inspection. Water flow was not visible, possibly due to a lack of sufficient differential head, therefore it was not evident how much (if any) blockage remains due to storm debris. The timber walkway has separated from its support beam at one end.
- B. Site/Structure # 25** –The structure remains covered with marsh debris from the storm. The gates were padlocked closed at the time of the inspection. It was not evident how much (if any) blockage remains due to storm debris.
- C. Site/Structure # 26** – The structure is still covered with storm debris. The gates were in the open position at the time of the inspection. Water flow was not visible, possibly due to a lack of sufficient differential head, therefore it was not evident how much (if any) blockage remains due to storm debris.
- D. Site/Structure # 32** –Overall condition was good with the exception of the area that was vandalized in early 2003. That area was partially repaired by the 2003 inspection team; however, that repair was again vandalized to the original depth. The condition of the closure appears not to have changed, most of the storm debris is gone. This structure was constructed to keep diversion water from entering Lake Leary from the western lake rim; the storm devastated that portion of the lake rim rendering this structure ineffective. Nothing needs to be done until the Lake Lery shoreline is rebuilt.
- E. Site/ Structure # 40** – The structure is still covered with storm debris. The gates were in the open position at the time of the inspection. Water flow was not visible, possibly due to a lack of sufficient differential head and water hyacinths on the surface, therefore it was not evident how much blockage remains due to storm debris.
- F. Site/Structure # 50** – The gate was in the open position at the time of the inspection. Water flow was not visible, therefore it was not evident how much (if any) blockage remains due to storm debris. The timber walkway is slightly bowed.
- G. Site/Structure #52** – The gates were in the open position at the time of the inspection. There appeared to be a vortex on the water surface near the inlet of the right hand culvert indicating some water flow. It was not evident how much blockage remains due to storm debris in the culverts. There was a breach of the spoil bank to the right and left of the plug allowing flow from the canal to the marsh.
- H. Site/Structure # 54** – The structure still has some storm debris. The gates were in the open position at the time of the inspection. Water flow was not visible, due to a lack of sufficient differential head therefore it was not evident how much blockage remains due to storm debris.
- I. Site/ Structure # 56** - No subsidence was noted in this rock structure since the 2005 inspection. Some storm debris remains on the entire rock closure. The warning signs that were damaged during the storm have been reset.

- J. Site # 57** –It appears that the vegetation on the spoil bank along the sides of the Reggio Canal that was damaged by the storm is recovering although many sparse areas remain.
- K. Site # 58** –The vegetation on the spoil bank along the sides of the Bayou Mandeville that was damaged by the storm is recovering although many sparse areas remain.
- L. Site/Structure # 60** – The gate structure is still covered with storm debris. The gates were in the open position at the time of the inspection. Water flow was slightly visible, therefore it was not known just how much blockage remains due to storm debris.

VI. Conclusions and recommendations

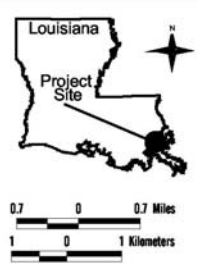
1. As you can see from the inspection report and photographs, areas of the outfall project show good signs of recovery from the Katrina Storm event. This recovery appears to be due to a steady moderate to high flow of river water through the diversion. Many structures may still be blocked by storm debris, but are slowly being cleaned out by tidal exchange through the culverts. Continuing repair operations to the levee breaches that occurred behind Braithwaite and Scarsdale prevent the structure from being operated above 5,000 cfs in fear of further flooding to the east bank of Plaquemines Parish.
2. It is LDNR's- conclusion that, the outfall project may never be restored to its original condition. The entire complexion of the project has been changed. It will take clearing of the channels, refurbish and completely clean out all gated structures and culverts, repair all the washed out embankments that formed the perimeter affected by each individual structure. It will also be necessary to repair the entire west and north lake rim of Lake Leary that was damaged, so as not to allow diversion water to enter the lake from those sides.
3. LDNR suggests that little, if anything, be done until we can aggressively operate the diversion structure for a full two years with hopes that much of the marsh debris that was deposited by the storm will be displaced from the project area. It is also thought that by operating the structure aggressively, will allow more desirable vegetation to take over and expand where it did exist before the storm.
4. LDNR would also like to suggest that the State and NRCS meet and discuss the future of the outfall project.
There are events that took place, and are still taking place, since the projects' conception that may have altered the usefulness of, and necessity for the project. They are:
 - a. Resolution of the oyster litigation that for so long influenced the operational plan for the diversion.
 - b. Severe storm damage that changed the complexion of the entire outfall landscape.

- c.** Legislation resulting from the storm damage that granted the project \$10.1 million by the 4th supplemental appropriation. These funds will be used to modify the Caernarvon Freshwater Diversion Project by restoring the surrounding wetlands to reverse wetland losses and modification of the main structure and its operations.
- d.** Under this supplemental appropriation, the COE will look to re-authorize the project in order to maximize freshwater diversion to the Breton Sound Basin.

All of these events will alter the justification of the Caernarvon Outfall Project as we now see it. It is anticipated that the low flows that initially were an integral part of the yearly operational plan will be a thing of the past. We are now looking at a more aggressive flow plan and, if the project is re-authorized, and given the demand for more introduction of freshwater into the marshes, could approach maximum flow whenever the river stage will allow.

APPENDIX A
Project Features Map

2007 Annual Inspection Report
 CAERNARVON OUTFALL MANAGEMENT
 State Project No. BS-03a



Data Source:
 U.S. Geological Survey
 National Wetlands Research Center
 Coastal Restoration Field Station

Louisiana Department of Natural Resources
 Coastal Restoration Division and GIS Lab
 1998 DOQQ Imagery

Map Date: January 30, 2003
 Map ID: USGS-NWRC 2003-04-185

- Plug (no action; maintenance item)
- Plug
- Culvert with exterior sluice gates
- Culvert with interior combination gates
- Strata Boundary
- Spoil Bank Restoration
- BS-03a Project Boundary
- BS-03a Reference Boundary

APPENDIX B
Photographs



Photo # 1 Site 13 (view 1) Corrosion of locking plates caused them to separate making locking impossible. (Photo from 2005 inspection)



Photo # 2 Site 13 (view 2) The extent of blockage of the culvert due to storm debris is unknown. Note the high water stages, both in Bayou Mandeville and in the interior marsh.



Photo # 3 Site 25 The structure remains covered with storm debris. Both of the gates remained closed to reduce flow to the Braithwaite area where the USACE is constructing an emergency levee contract.



Photo #4 Site 26 The structure remains covered with storm debris. The extent of blockage of the culverts by storm debris is unknown. The flowmeter and all attachments were destroyed by the storm.



Photo # 5 Site 32 (view 1) This structure was opened to the waterline by vandals and was partially repaired by the 2003 inspection team. It was then vandalized again. Lake Leary is in background.



Photo # 6 Site 32 (view 2) Close up view of the vandalized area. Approximately 30% of the west lake rim was destroyed by the storms.



Photo # 7 Site 40 The structure remains covered with storm debris. The extent of blockage of the culverts by storm debris is unknown. The flowmeter was damaged but recovered. Note the high water stages from the structure westward to the Plaquemines east bank hurricane levee in the background.



Photo # 8 Site 50 The extent of blockage of the culverts by storm debris is unknown. Slight erosion was evident on both sides of the rock plug where it ties into the earthen embankment. High flows such as this, allow water to flow around the structures to flood the marsh.



Photo # 9 Site 52 (view 1) Some storm debris remains. The extent of blockage of the culverts by storm debris is unknown. Slight erosion was evident on both sides of the rock plug where it ties into the earthen embankment.



Photo # 10 Site 52 (view 2) This breach in the earthen embankment is approximately 100 yards to the west of the rock plug. Many of these breaches are evident throughout the outfall area allowing free flowage from the conveyance channels into the interior marshes.



Photo # 11 Site 54 Some storm debris remains. The extent of blockage of the culverts by storm debris is unknown. The flowmeter and all attachments on this structure were destroyed by the storm.



Photo #12 Site 56 The overall condition of the rock closure appears to be good. No appreciable subsidence has occurred since the post-storm inspection. Note the greater subsidence occurred at the center of the closure.



Photo # 13 Site 57 (view 1) Reggio Canal spoil bank. Storm damage is still visible, but vegetation is recovering slowly.



Photo # 14 Site 57 (view 2) Reggio Canal spoil bank. More recovering vegetation. Water levels in the marsh and the conveyance channel remains equal due to amount of damage to the spoil banks.



Photo # 15 Site 57(view 3) Reggio Canal spoil bank. More recovering vegetation. Note the gaps on the spoil bank caused by the storms.



Photo # 16 Site 57 (view 4) Reggio Canal spoil bank. More recovering vegetation.



Photo # 17 Site 58 (view 1) Bayou Mandeville spoil bank. Many damaged trees along the bank line are being removed by the landowner.



Photo # 18 Site 58 (view 2) Bayou Mandeville spoil bank. Most of the interior marsh along this channel is flooded with river water from the diversion. Notice the amount of sediment that is visible in this area just north of Lake Leary.



Photo # 19 Site 58 (view 3) Bayou Mandeville spoil bank.



Photo # 20 Site 60 Storm debris remains on the structure. The extent of blockage of the culverts due to storm debris is unknown. Some flow was visible through the culverts.

Appendix C
Three-Year Operations & Maintenance Budgets

2007 Annual Inspection Report
 CAERNARVON OUTFALL MANAGEMENT
 State Project No. BS-03a

OPERATION AND MAINTENANCE BUDGET WORKSHEET 2007/2008
 Caernarvon Diversion Outfall Management / BS-03a / PPL 2

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	\$4,290.00	\$4,290.00
General Structure Maintenance	LUMP	1	\$0.00	\$0.00
Engineering and Design	LUMP	1	\$0.00	\$0.00
Operations	LUMP	1	\$0.00	\$0.00
Construction Oversight	LUMP	1	\$0.00	\$0.00
ADMINISTRATION				
LDNR / CRD Admin.	LUMP	1	\$0.00	\$0.00
FEDERAL SPONSER Admin.	LUMP	0	\$0.00	\$0.00
SURVEY Admin.	LUMP	1	\$0.00	\$0.00
OTHER				\$0.00
TOTAL ADMINISTRATION COSTS:				\$0.00

MAINTENANCE / CONSTRUCTION

SURVEY				
SURVEY DESCRIPTION:				
Secondary Monument	EACH	0	\$0.00	\$0.00
Staff Gauge / Recorders	EACH	0	\$0.00	\$0.00
Marsh Elevation / Topography	LUMP	0	\$0.00	\$0.00
TBM Installation	EACH	0	\$0.00	\$0.00
OTHER				\$0.00
TOTAL SURVEY COSTS:				\$0.00

GEOTECHNICAL				
GEOTECH DESCRIPTION:				
Borings	EACH	0	\$0.00	\$0.00
OTHER				\$0.00
TOTAL GEOTECHNICAL COSTS:				\$0.00

CONSTRUCTION					
CONSTRUCTION DESCRIPTION:					
Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE	
	0	0.0	0	\$0.00	\$0.00
	0	0.0	0	\$0.00	\$0.00
	0	0.0	0	\$0.00	\$0.00
Filter Cloth / Geogrid Fabric	SQ YD		0	\$0.00	\$0.00
Navigation Aid	EACH		0	\$0.00	\$0.00
Signage	EACH		0	\$0.00	\$0.00
General Excavation / Fill	CU YD		0	\$0.00	\$0.00
Dredging	CU YD		0	\$0.00	\$0.00
Sheet Piles (Lin Ft or Sq Yds)			0	\$0.00	\$0.00
Timber Piles (each or lump sum)			0	\$0.00	\$0.00
Timber Members (each or lump sum)			0	\$0.00	\$0.00
Hardware	LUMP		1	\$0.00	\$0.00
Materials	LUMP		1	\$0.00	\$0.00
Mob / Demob	LUMP		1	\$0.00	\$0.00
Contingency	LUMP		1	\$0.00	\$0.00
General Structure Maintenance	LUMP		1	\$0.00	\$0.00
OTHER				\$0.00	\$0.00
OTHER				\$0.00	\$0.00
OTHER				\$0.00	\$0.00
TOTAL CONSTRUCTION COSTS:					\$0.00

TOTAL OPERATIONS AND MAINTENANCE BUDGET: \$4,290.00

2007 Annual Inspection Report
 CAERNARVON OUTFALL MANAGEMENT
 State Project No. BS-03a

OPERATION AND MAINTENANCE BUDGET WORKSHEET 2008/2009
 Caernarvon Diversion Outfall Management / BS-03a / PPL 2

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	\$4,401.00	\$4,401.00
General Structure Maintenance	LUMP	1	\$0.00	\$0.00
Engineering and Design	LUMP	1	\$0.00	\$0.00
Operations	LUMP	1	\$0.00	\$0.00
Construction Oversight	LUMP	1	\$0.00	\$0.00
ADMINISTRATION				
LDNR / CRD Admin.	LUMP	0	\$0.00	\$0.00
FEDERAL SPONSER Admin.	LUMP	0	\$0.00	\$0.00
SURVEY Admin.	LUMP	0	\$0.00	\$0.00
OTHER				\$0.00
TOTAL ADMINISTRATION COSTS:				\$0.00

MAINTENANCE / CONSTRUCTION

SURVEY				
SURVEY DESCRIPTION:				
Secondary Monument	EACH	0	\$0.00	\$0.00
Staff Gauge / Recorders	EACH	0	\$0.00	\$0.00
Marsh Elevation / Topography	LUMP	0	\$0.00	\$0.00
TBM Installation	EACH	0	\$0.00	\$0.00
OTHER				\$0.00
TOTAL SURVEY COSTS:				\$0.00

GEOTECHNICAL				
GEOTECH DESCRIPTION:				
Borings	EACH	0	\$0.00	\$0.00
OTHER				\$0.00
TOTAL GEOTECHNICAL COSTS:				\$0.00

CONSTRUCTION					
CONSTRUCTION DESCRIPTION:					
Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE	
	0	0.0	0	\$0.00	\$0.00
	0	0.0	0	\$0.00	\$0.00
	0	0.0	0	\$0.00	\$0.00
Filter Cloth / Geogrid Fabric	SQ YD		0	\$0.00	\$0.00
Navigation Aid	EACH		0	\$0.00	\$0.00
Signage	EACH		0	\$0.00	\$0.00
General Excavation / Fill	CU YD		0	\$0.00	\$0.00
Dredging	CU YD		0	\$0.00	\$0.00
Sheet Piles (Lin Ft or Sq Yds)			0	\$0.00	\$0.00
Timber Piles (each or lump sum)			0	\$0.00	\$0.00
Timber Members (each or lump sum)			0	\$0.00	\$0.00
Hardware	LUMP		1	\$0.00	\$0.00
Materials	LUMP		1	\$0.00	\$0.00
Mob / Demob	LUMP		1	\$0.00	\$0.00
Contingency	LUMP		1	\$0.00	\$0.00
General Structure Maintenance	LUMP		1	\$0.00	\$0.00
OTHER				\$0.00	\$0.00
OTHER				\$0.00	\$0.00
OTHER				\$0.00	\$0.00
TOTAL CONSTRUCTION COSTS:					\$0.00

TOTAL OPERATIONS AND MAINTENANCE BUDGET: \$4,401.00

2007 Annual Inspection Report
 CAERNARVON OUTFALL MANAGEMENT
 State Project No. BS-03a

OPERATION AND MAINTENANCE BUDGET WORKSHEET 2009/2010
 Caernarvon Diversion Outfall Management / BS-03a / PPL 2

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	\$4,516.00	\$4,516.00
General Structure Maintenance	LUMP	1	\$0.00	\$0.00
Engineering and Design	LUMP	1	\$0.00	\$0.00
Operations	LUMP	1	\$0.00	\$0.00
Construction Oversight	LUMP	1	\$0.00	\$0.00

ADMINISTRATION

LDNR / CRD Admin.	LUMP	0	\$0.00	\$0.00
FEDERAL SPONSER Admin.	LUMP	0	\$0.00	\$0.00
SURVEY Admin.	LUMP	0	\$0.00	\$0.00
OTHER				\$0.00
TOTAL ADMINISTRATION COSTS:				\$0.00

MAINTENANCE / CONSTRUCTION

SURVEY

SURVEY DESCRIPTION:					
Secondary Monument	EACH	0	\$0.00	\$0.00	\$0.00
Staff Gauge / Recorders	EACH	0	\$0.00	\$0.00	\$0.00
Marsh Elevation / Topography	LUMP	0	\$0.00	\$0.00	\$0.00
TBM Installation	EACH	0	\$0.00	\$0.00	\$0.00
OTHER					\$0.00
TOTAL SURVEY COSTS:					\$0.00

GEOTECHNICAL

GEOTECH DESCRIPTION:					
Borings	EACH	0	\$0.00	\$0.00	\$0.00
OTHER					\$0.00
TOTAL GEOTECHNICAL COSTS:					\$0.00

CONSTRUCTION

CONSTRUCTION DESCRIPTION:						
Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE		
	0	0.0	0	\$0.00	\$0.00	\$0.00
	0	0.0	0	\$0.00	\$0.00	\$0.00
	0	0.0	0	\$0.00	\$0.00	\$0.00
Filter Cloth / Geogrid Fabric	SQ YD	0	\$0.00	\$0.00	\$0.00	\$0.00
Navigation Aid	EACH	0	\$0.00	\$0.00	\$0.00	\$0.00
Signage	EACH	0	\$0.00	\$0.00	\$0.00	\$0.00
General Excavation / Fill	CU YD	0	\$0.00	\$0.00	\$0.00	\$0.00
Dredging	CU YD	0	\$0.00	\$0.00	\$0.00	\$0.00
Sheet Piles (Lin Ft or Sq Yds)		0	\$0.00	\$0.00	\$0.00	\$0.00
Timber Piles (each or lump sum)		0	\$0.00	\$0.00	\$0.00	\$0.00
Timber Members (each or lump sum)		0	\$0.00	\$0.00	\$0.00	\$0.00
Hardware	LUMP	1	\$0.00	\$0.00	\$0.00	\$0.00
Materials	LUMP	1	\$0.00	\$0.00	\$0.00	\$0.00
Mob / Demob	LUMP	1	\$0.00	\$0.00	\$0.00	\$0.00
Contingency	LUMP	1	\$0.00	\$0.00	\$0.00	\$0.00
General Structure Maintenance	LUMP	1	\$0.00	\$0.00	\$0.00	\$0.00
OTHER				\$0.00	\$0.00	\$0.00
OTHER				\$0.00	\$0.00	\$0.00
OTHER				\$0.00	\$0.00	\$0.00
TOTAL CONSTRUCTION COSTS:						\$0.00

TOTAL OPERATIONS AND MAINTENANCE BUDGET: \$4,516.00

2007 Annual Inspection Report
CAERNARVON OUTFALL MANAGEMENT
State Project No. BS-03a

Appendix D
Field Inspection Form

2007 Annual Inspection Report
 CAERNARVON OUTFALL MANAGEMENT
 State Project No. BS-03a

FIELD INSPECTION CHECK SHEET

Project No. / Name: Caernarvon Outfall Management BS-03a Date of Inspection: 3/27/2007 Time: 10:00 AM
 Structure No. See Report Section III Inspector(s): LDNR: Tom Bernard, Barry Richard, Peter Hopkins, Brady Carter
 Structure Description: See Report Section III Water Level: Inside: _____ Outside: _____
 Type of Inspection: 2007 Annual Inspection Weather Conditions: Clear and Warm, Wind SW 10 - 15 mph

Item	Condition	Physical Damage	Corrosion	Photo	Observations and Remarks
CMP Culverts Earthen / Rock Embankment	Fair	None	None	Appendix B	Some of the culverts have rotated slightly with the differential settlement of the rock structure. Most of the visible storm debris has cleared from the embankments. It is unknown how much blockage remains in the culverts.
Water Control Gates	Fair	None	Slight	Appendix B	All water Control Gates appear to be in fair condition. Bundles of marsh still cover some of the gates and the operating mechanism, however they appear to be operable. The end of the DP canal is blocked by storm displaced marsh.
Rock Canal Closures	Good	See Remarks	N/A	Appendix B	The overall condition of the canal closures is good with small areas of erosion where the rock meets the earthen embankment. The partial repairs (to the vandalism) made by the 2003 inspection team at site #32 was again vandalized.
Timber Piling at Culverts	Good	None	None	Appendix B	All of the timber piling are fine, some of the rock structures have settled as well as the culvert themselves causing some slight rotation in the culverts. Storm debris still covers portions of some rock closures.
Timber walkways at Culverts	Good	See Remarks	None	Appendix B	Some of the 4 X 4 timber support posts for the timber walkways settled excessively causing the timber walkway to bend and twist slightly. Some walkways are still riddled with large amounts of displaced marsh debris.
Spoilbank Restoration	Good	Minor	N/A	Appendix B	The storm surge has caused extensive damage to all spoilbank work, which was susceptible to erosion from waves. Some of these areas will need to be revegetated in time or armored with riprap. Vegetation is recovering at several locations.
Flow Meters	Good	None	None	Appendix B	Flow meters were installed at structures No. 26, 40, and 54 to monitor the flow of water going into the interior marsh were destroyed/damaged and have not yet been replaced.